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March 28, 2022

Proposal QTB154877

Mr. Dave Oakes  
Minnesota Pollution Control Agency  
714 Lake Avenue, Suite 229  
Detroit Lakes, MN 56501

Re: Work Plan and Budget  
Groundwater Investigation  
Temporary Monitoring Well Installation  
Bunker Lake Boulevard NW  
Andover, Anoka County, Minnesota 55304

Dear Mr. Oakes:

At the request of the Minnesota Pollution Control Agency (MPCA), Braun Intertec Corporation has prepared this Work Plan for a groundwater investigation to include installation and sampling of temporary groundwater monitoring wells at five locations on the south side of Bunker Lake Boulevard NW within the right-of-way (ROW), in Andover, Anoka County, Minnesota (Study Area). The proposed work will be completed in Fiscal Year 2022 (FY2022) pending no complications in obtaining access/permitting or State Drilling Contractor availability. This Work Plan describes the Scope of Work that Braun Intertec will provide for the project. A Work Plan Budget is attached as Table 1. The costs for developing the documents and general work products are based on the labor rates in our Professional and Technical Services Remediation Master Contract (#142379) and the estimated level of effort for completing the work.

## Background Information

For purposes of this investigation, the Study Area includes Bunker Lake Boulevard NW ROW and consists of numerous commercial developments on the south side of the roadway and residential neighborhoods and wetlands on the north side of the roadway. The South Andover Superfund Site was present south of Study Area which is redeveloped with commercial businesses. This Superfund Site was used for auto salvage from the early 1950s to the 1980s and was reportedly also used for the disposal of hazardous wastes, including inks, paint thinners, paint sludges, acids, petroleum, and chlorinated solvents. Based on 1988 Record of Decision, chlorinated volatile organic compounds (VOCs) were historically detected in groundwater at the site including of 1,1,1-trichloroethane (TCA), trichloroethylene (TCE) and vinyl chloride. Groundwater contour maps depicted shallow groundwater on the north side of the South Andover Site having a gradient to the north and northwest. The Red Oaks Neighborhood, which has domestic wells impacted with 1,4-dioxane and per- and polyfluoroalkyl substances (PFAS), is located approximately 1,000 feet to the north. Braun Intertec recently completed a preliminary source evaluation to evaluate the potential sources of the impacted domestic wells, the results of which are presented in a report dated February 8, 2022. The report identified the South Andover Site as a potential contributing source of the domestic well impacts and recommended additional investigation to evaluate the potential source(s).

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Minnesota Pollution Control Agency  
Bunker Lake Boulevard NW  
Proposal QTB154877  
March 28, 2022  
Page 2

This Work Plan presents the proposed Scope of Work as requested by the MPCA and based on our review of the available technical information.

## **Investigation Approach**

The purpose of this investigation is to assess current groundwater quality between the South Andover Superfund Site located south of Bunker Lakes Boulevard which has documented chlorinated VOC impacts and the Red Oaks Neighborhood located approximately 1,000 feet to the north which has domestic water wells impacted with 1,4-dioxane. Specifically, this investigation will evaluate the presence or absence of contaminants in the shallow/upper sand aquifer and in the deeper sand (buried artesian) aquifer that underlies a confining clay unit. The groundwater quality data will be obtained by completing temporary monitoring wells at five locations and collecting discreet groundwater samples to vertically profile potential impacts south of Bunker Lake Boulevard NW. The tentative temporary well locations have been selected with input from MPCA and are expected to be located within City of Andover ROW areas. These temporary well/sampling locations are depicted on the attached map.

This Work Plan is based upon an estimated depth to groundwater of approximately 10 to 15 feet below ground surface (bgs), and an estimated depth to the underlying confining clay unit of approximately 50 feet bgs. During investigation activities, two discreet water samples will be collected from the temporary wells for laboratory analysis (one shallow at approximately 10-15 feet bgs and one above the confining clay unit at approximately 35 to 45 feet bgs).

Because of different soil conditions will be encountered above and below the clay confining unit, the scope of drilling will be split into two phases/mobilizations. The initial drilling/sampling will include temporary monitoring wells set in the upper sand aquifer above the clay confining unit, and the second phase will be completed in the deeper sand aquifer. The proposed/sampling locations will first be drilled to the depth (approximately 40 feet bgs) using a hydraulically driven push-probe sampling rig. The drilling for the temporary wells within the deeper sand aquifer will be completed using the rotasonic drilling method because of dense soil conditions and heaving sands.

## **Conflict of Interest Statement**

To the best of our knowledge, no conflict of interest would be created by the performance of work by Braun Intertec for the State of Minnesota at the Site (identified above). To the best of the firm's knowledge, no relationship exists between the firm, its parent companies, affiliates, subcontractors, and subsidiaries, or any potentially responsible persons involved with the work described in this Work Plan.

## **Insurance Clause**

Builders Risk Insurance is not needed for this work order, there will be no construction of buildings or installation of mechanical or equipment. Boiler & Machinery Insurance is not needed and not required per the Department of Administration/Risk Management and the MPCA.

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## Scope of Work

### ***Task 1: Access Coordination***

The MPCA requested Scope of Work includes installation of temporary monitoring wells at five locations in ROW on the south side of Bunker Lake Boulevard NW. As part of this task, Braun Intertec will communicate with the City of Andover (City) with respect to the proposed monitoring well installation activities and to obtain ROW and any other permits as if required by the City.

Braun Intertec will stake the proposed well locations and the State Drilling Contractor will clear public utilities using Gopher State One Call. In addition, the Drilling Contractor will obtain required permits from the Minnesota Department of Health (MDH) for each well.

### ***Task 2A: Installation and Sampling of Temporary Monitoring Wells (Upper Sand Aquifer)***

As part of this task, the following activities will be completed:

- Braun Intertec will prepare a drilling specification for drilling/installation of the temporary wells and obtain quotes from State Drilling Contractors to conduct hydraulically driven push-probe sampling (Task 2A) and rotosonic drilling (Task 2B). The drilling specifications will be provided to three State Drilling Contractors and quotes will be requested for completion of the work following the procedures outlined in the MPCA Contractor and Subcontracting Manual. Following receipt, Braun Intertec will review the quotes and provide a recommendation to the MPCA Project Leader for selection of the low-cost responsive Drilling Contractor. Following approval by MPCA, the selected Drilling Contractor will be subcontracted as specified in Task 4.
- The Drilling Contractor will complete hydraulically driven push-probe sampling at five temporary well locations. During investigation activities, two discreet water samples will be collected from each temporary well (8 samples total) for laboratory analysis. One sample will be collected shallow at a depth of approximately 10-15 feet bgs and the other from just above the confining clay unit at approximately 35-45 feet bgs.
- The push probe borings will be advanced using dual-tube sampling system. The dual-tube equipment will be utilized to facilitate collection of a shallow and deeper groundwater sample above the confining clay unit. The dual-tube equipment will include a 2.25-inch outside diameter outer casing designed to keep the borehole from collapsing, and a 1.125-inch diameter inner sampling core. Each soil boring will be advanced to the first encountered water-bearing soils. At that time, a stainless-steel groundwater sampling screen will be deployed to sample groundwater at the water table. After collecting the groundwater sample, the stainless-steel sample screen will be removed and decontaminated using a final PFAS-free water rinse. Each boring will be continued to approximately 35 to 40 feet bgs using the same sampling technology and methods as described above. After the deeper groundwater samples are collected, all tooling will be removed, and boreholes sealed per MDH requirements.

Minnesota Pollution Control Agency  
Bunker Lake Boulevard NW  
Proposal QTB154877  
March 28, 2022  
Page 4

- Braun Intertec will conduct environmental monitoring during all drilling activities, including logging the subsurface geology of each borehole, conducting organic vapor screening of soil cores from each borehole using a photoionization detector (PID), and taking manual water level measurements to the nearest 0.01 feet prior to sampling. No specific soil samples will be completed from the individual borings for analytical testing, because significant soil contamination is not expected to be encountered at the proposed temporary well locations.
- The ten groundwater samples from the temporary wells will be placed in clean laboratory-provided containers with appropriate preservative and submitted to the MDH environmental laboratory as specified in Task 4 for analysis of VOCs, 1,4-dioxane, and PFAS. In addition, quality control/quality assurance (QA/QC) samples will also be collected for analysis including one duplicate water sample, a field blank, an equipment blank, and a trip blank; the QA/QC samples will be submitted to the MDH environmental laboratory as specified in Task 4 for analysis of VOCs, 1,4-dioxane, and PFAS.
- Following installation, the x-y coordinates of the temporary monitoring well locations will be determined using a portable GPS unit with sub-meter accuracy. The ground surface will be measured to the nearest 0.1 feet using the portable GPS.
- Soil cuttings generated during drilling will be containerized in 55-gallon drums and transferred to the Waste Disposal Engineering (WDE) Landfill and temporarily stored pending disposal by a State Waste Disposal Contractor (see Task 4). One representative “grab” sample of the soil cuttings will be collected and submitted to a State Laboratory Contractor for waste disposal characterization parameters as described in Task 4.

#### ***Task 2B: Installation and Sampling of Temporary Monitoring Wells (Deeper Sand Aquifer)***

It is expected that dense soil conditions and heaving sand conditions will be encountered below the clay confining unit, thus drilling for the five temporary wells in the deeper sand aquifer will be completed using the rotosonic drilling method. The drilling and sampling activities as described above in Task 2A will be consistent with the drilling of the deeper sand aquifer, with the addition of the following activities:

- The rotosonic rig will be advanced through and below the clay confining unit to approximately 10 to 20 feet into the deeper sand aquifer. Continuous soil cores will be obtained from below 40 feet bgs during drilling to the base of each boring. The temporary wells will be constructed using 2-inch inside diameter (I.D.) Schedule 40 PVC casing and 10-foot long 10 slot PVC screens.
- Groundwater samples will be collected from each of the five temporary well using a bladder pump with new tubing. The pump will be decontaminated using a final PFAS-free water rinse, and a new pump bladder and tubing will be used for each well location to reduce the risk of potential cross-contamination. Following sampling, the temporary well materials will be removed, and the boreholes sealed per MDH requirements.
- The five groundwater samples from the deeper sand aquifer will be submitted to the MDH environmental laboratory for analysis of VOCs, 1,4-dioxane, and PFAS. QA/QC samples will also be collected for analysis including a duplicate sample, a field blank, an equipment blank, and a trip blank; the QA/QC samples will be submitted to the MDH environmental laboratory as specified in Task 4 for analysis of VOCs, 1,4-dioxane, and PFAS.

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Minnesota Pollution Control Agency  
Bunker Lake Boulevard NW  
Proposal QTB154877  
March 28, 2022  
Page 5

- Investigation derived waste (IDW) consisting of excess cuttings, purge water and soil/sediment generated during roto-sonic drilling will be containerized in 55-gallon drums and managed and temporarily stored at the WDE Landfill with the soil cuttings generated by the push probe borings. One sample of soil cuttings will be submitted to a State Laboratory Contractor and one sample of liquid IDW will be submitted to the MDH environmental laboratory for waste disposal characterization parameters as described in Task 4. Analytical results for VOCs, 1,4-dioxane and PFAS for the groundwater samples will also be used to profile liquid IDW.

### ***Task 3: Reporting***

Following completion of field work, Braun Intertec will prepare a summary report which documents the temporary well installation and sampling activities. The report will include dates work was completed, pertinent field observations, summary of the analytical testing results for the groundwater and QA/QC samples, boring logs, MDH sealing records, analytical testing reports, and chain-of-custody forms.

### ***Task 4: Subcontractors***

#### Drilling Services

Drilling services for the groundwater investigation activities will be provided by a State Drilling Contractor under subcontract to Braun Intertec. Because the drilling of the shallow sand aquifer may be completed at a different time than the deeper sand aquifer temporary wells, the drilling quotation will include two mobilizations and the quotation separated, one for the push-probe drilling and one for roto-sonic drilling. The Drilling Contractor will be selected based on the bidding process described under Task 2A. Once the Work Order is issued and the MPCA has approved the Drilling Contractor, a State Contract Order Form (SCOF) will be executed for the drilling services.

#### Analytical Testing Services

Braun Intertec will subcontract a State Laboratory Contractor to conduct analytical testing of the IDW soil samples described under Tasks 2A and 2B. All groundwater, QA/QC and liquid IDW samples will be submitted for analysis to the MDH environmental laboratory in St. Paul, Minnesota. The Work Plan Budget includes time for coordination with the MDH laboratory as well as time to pick up sample containers and drop off the collected samples but does not include the analytical testing costs for those samples.

The analytical scope for the State Laboratory Contractor will include:

- *Task 2A (Upper Sand Aquifer Borings/Wells):* Analysis of one IDW soil composite sample for disposal characterization parameters including VOCs by EPA Method 8260, TCLP Resource Conservation and Recovery Act (RCRA) metals EPA Methods 1311, 6010 and 7470, polychlorinated biphenyls (PCBs) by EPA Method 8082A, flash point by EPA Method 1010A, semi-volatile organics (SVOCs) by EPA Method 8270, and PFAS per MPCA guidance/ENV-SOP-MIN4-0170. Also, analysis of one methanol trip blank for VOCs by EPA Method 8260.
- *Task 2B (Deeper Sand Aquifer):* Analysis of one IDW soil composite sample for VOCs, DRO, TCLP metals, flashpoint, PCBs, SVOCs, and PFAS by the methods specified above.

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Minnesota Pollution Control Agency  
 Bunker Lake Boulevard NW  
 Proposal QTB154877  
 March 28, 2022  
 Page 6

The analytical scope for the MDH environmental laboratory will include:

- *Task 2A (Upper Sand Aquifer Borings/Wells):* Analysis of 10 groundwater samples and four QA/QC samples for VOCs by EPA Method 8260, 1,4-dioxane by EPA Method 8270SIM, and PFAS by EPA Method 537.
- *Task 2B (Deeper Sand Aquifer):* Analysis of five groundwater samples and four QA/QC samples for VOCs by EPA Method 8260 and 1,4-dioxane by EPA Method 8270SIM, and PFAS by EPA Method 537. Also, analysis of one composite sample of IDW liquid for VOCs, DRO, dissolved RCRA metals, PCBs, and SVOCs by the methods specified above.

Both the State Laboratory Contractor and the MDH environmental laboratory will be instructed to submit analytical results to the MPCA in Lab\_MN format.

#### IDW Disposal Services

A State Waste Disposal Contractor will be subcontracted to provide disposal of IDW generated during groundwater investigation activities. The estimated cost provided in the Work Plan Budget is based on disposal as non-hazardous industrial waste. Upon issuance of the Work Order, a formal quote will be obtained, and Waste Disposal Contractor selected per the procedures outlined in the MPCA Contractor and Subcontracting Purchase Manual.

## Retainage

For work completed under this Work Plan, Braun Intertec will withhold 10% retainage on all fees, expenses, and subcontractors until the final project invoice.

## Project Personnel

The Braun Intertec Project Manager for the project will be Steve Jansen and/or Brad Ullery. The following staff levels will be utilized on this project as detailed in the Work Plan Budget: Scientist 1, Scientist 2, Field Technician, QA/QC Officer, and GIS/CADD Specialist.

## Scheduling

We will begin work immediately after receiving written authorization; our schedule is as follows:

<b>Activity</b>	<b>Completion Date*</b>
Task 1 – Well Access Coordination	4 weeks
Task 2 – Temporary Monitoring Well Installation/Sampling	6 - 10 weeks*
Task 3 – Reporting	11 - 12 weeks
*From date of Work Order approval. All work will be completed before June 30, 2022.	
*Drilling schedule for Task 2B could be impacted by State Drilling Contactor availability.	

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Minnesota Pollution Control Agency  
Bunker Lake Boulevard NW  
Proposal QTB154877  
March 28, 2022  
Page 7

## Closing Remarks

If you have any questions regarding this Work Plan or the attached Budget, please call Brad Ullery at 952.995.2675 or Steve Jansen at 612.599.2219.

Prepared by:  
BRAUN INTERTEC CORPORATION

Brad Ullery, LPG, CHMM  
Project Scientist

Stephen T. Jansen, MS, PG  
Vice President, Principal Scientist

### Attachments:

Table 1: Work Plan Budget  
Proposed Investigation Locations